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PROPERTIES OF PULPS, PAPERS, PAPERBOARDS, HARDBOARDS, AND
PARTICLEBOARDS MANUFACTURED IN OR IMPORTED INTO THE PHILIPPINES

By

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October 1977



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Table 1.--Properties^{1/} of pulps manufactured in or imported into the Philippines

Identifica- tion	Beating time	Freeness (Canadian Standard)	Burst factor	Tear factor	Breaking length	Apparent density	Bright- ness (Elrepho)
	Min	M1			M	G/cm ³	Pct
ABACA PULP							
Philippines - 25,920	0	595	79.3	431.7	9,655	0.54	--
	10	380	115.2	175.6	13,510	.63	--
	12	335	117.8	168.9	13,515	.64	--
	16	275	121.4	168.4	13,890	.66	--
UNBLEACHED KRAFT PULPS							
USA - 25,905	2	700	21.3	270.5	4,425	.61	--
	15	610	49.1	163.6	7,490	.64	--
	34	415	71.8	128.6	7,835	.67	--
	46	240	77.3	120.6	10,245	.70	--
USA - 25,908	9	715	36.4	292.6	5,840	.62	--
	35	580	74.0	151.6	9,130	.67	--
	54	395	85.1	133.8	10,375	.70	--
	65	250	91.0	122.2	11,055	.71	--
USA - 25,910	10	705	32.0	189.7	5,455	.58	--
	35	470	58.1	131.6	8,370	.64	--
	42	355	59.9	120.5	8,715	.66	--
	48	265	62.9	115.6	8,965	.66	--
USA - 25,917	10	725	23.3	292.1	5,245	.55	--
	47	610	66.2	157.3	9,565	.64	--
	74	400	79.0	139.8	10,990	.67	--
	91	240	87.0	131.1	12,065	.68	--
Canada - 25,907	0	700	16.8	228.3	3,300	.56	--
	15	615	59.4	145.5	8,150	.66	--
	34	470	80.9	115.6	10,565	.70	--
	59	250	92.9	107.5	11,670	.73	--
Canada - 25,909	0	705	14.9	242.5	3,100	.58	--
	20	600	62.1	147.8	8,365	.66	--
	41	430	79.8	113.7	10,450	.71	--
	65	240	92.0	104.2	11,400	.73	--

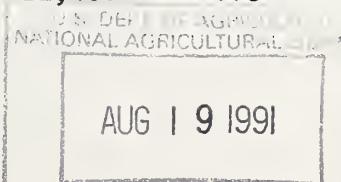




Table 1.--Properties^{1/} of pulps manufactured in or imported into the Philippines--Con.

Identifica- tion	Beating time	Freeness (Canadian Standard)	Burst factor	Tear factor	Breaking length	Apparent density	Bright- ness (Elrepho)
	<u>Min</u>	<u>M1</u>		<u>M</u>	<u>G/cm³</u>		<u>Pct</u>
UNBLEACHED KRAFT PULPS--Con.							
Canada - 25,912	5	695	21.8	259.4	4,435	0.57	--
	21	600	52.2	145.2	7,855	.64	--
	39	425	68.9	128.6	9,645	.68	--
	54	260	74.5	121.2	10,330	.70	--
New Zealand - 25,906	5	720	23.3	293.6	5,055	.59	--
	36	610	67.1	137.9	10,145	.65	--
	54	425	79.4	126.7	10,955	.68	--
	68	270	88.3	118.0	11,680	.70	--
Africa - 25,918	15	715	35.4	197.3	6,115	.58	--
	37	555	61.8	147.9	8,580	.63	--
	50	390	70.3	134.4	10,005	.66	--
	60	265	71.8	121.8	10,120	.66	--
Africa - 25,919	20	705	44.1	204.2	6,660	.58	--
	45	525	62.5	163.4	9,050	.62	--
	55	375	67.8	155.7	9,300	.63	--
	64	260	71.0	150.6	9,530	.65	--
UNBLEACHED SULFITE PULP							
USA - 25,911	9	670	1880	133.7	3,620	.59	--
	17	560	27.8	106.7	5,020	.64	--
	24	460	33.7	91.6	5,645	.66	--
	40	270	43.2	73.9	7,045	.73	--
BLEACHED KRAFT PULPS							
New Zealand - 25,914	10	720	31.4	291.4	5,285	.61	90.3
	36	605	67.6	158.2	8,970	.65	--
	57	410	79.9	139.6	10,345	.68	--
	72	250	87.4	123.6	11,020	.70	--
Finland - 25,915	0	625	8.8	51.5	2,740	.57	88.1
	27	505	30.9	77.4	6,170	.68	--
	49	350	46.1	71.5	8,015	.72	--
	62	255	52.7	66.6	8,350	.76	--



Table 1.--Properties^{1/} of pulps manufactured in or imported into the Philippines--Con.

Identifica- tion	Beating time	Freeness (Canadian Standard)	Burst factor	Tear factor	Breaking length	Apparent density	Bright- ness (Elrepho)
	<u>Min</u>	<u>M1</u>			<u>M</u>	<u>G/cm³</u>	<u>Pct</u>
BLEACHED SULFITE PULP							
USA - 25,916	6	685	15.9	145.4	3,580	0.62	86.2
	17	565	30.9	98.6	5,555	.66	--
	28	420	41.4	82.8	6,770	.70	--
	40	260	48.4	73.6	7,465	.72	--
BLEACHED GROUNDWOOD PULP							
Finland - 25,913	--	245	7.1	32.6	2,290	.44	65.1

1/Tests made according to TAPPI Standard Methods.



Table 2--Properties of printing and writing papers manufactured in the Philippines

Sheet properties^{1/}

Identifi- cation	Weight square meter	Thick- ness size/ meter	Density	Bursting strength MD/CD ^{2/}	Tearing resistance			Folding endurance			Porosity			Smoothness (Bekk)			Scattering coefficient			Brightness (Eirepho)			Castor oil penetration						
					Pts	G	Double folds	MD		CD		Wire Piw	Felt Piw	Sec 100 cm ³	Pct	Pct	Sec	Pct	Sec	Pct									
								MD	CD	MD	CD																		
NEWSPRINT																													
J-25,931	57.4	35.2	5.2	0.43	5.4	33.8	35.7	2	1	8.02	4.5	9.4	10.5	98.8	17.1	1.9	460.8	36.1	--	--	--	--	--	--	--	--			
0-25,932	57.0	35.0	3.8	.60	11.4	35.6	34.1	7	9	2.90	2.13	36.6	37.3	96.6	17.4	11.5	430.6	40.0	44.1	--	--	--	--	--	--	--			
B-25,933	53.4	32.8	4.6	.46	5.6	26.9	26.4	2	1	8.02	5.00	6.8	6.4	95.9	10.4	13.0	561.1	49.2	50.4	--	--	--	--	--	--	--			
B-25,934	53.4	32.8	4.3	.49	8.2	31.3	31.8	6	2	3.00	1.63	12.1	11.1	94.5	13.1	12.4	531.4	49.3	49.2	--	--	--	--	--	--	--			
TELEPHONE DIRECTORY																													
B-25,958	36.9	22.6	2.8	.53	8.6	15.9	23.3	19	3	10.5	4.4	25.1	28.5	80.5	21.0	31.6	491	54.4	53.1	--	--	--	--	--	--	--			
B-25,957	38.9	23.8	3.2	.49	6.7	20.2	31.9	12	1	8.4	3.4	8.4	7.5	83.2	22.8	25.2	575	--	--	--	--	--	--	--	--	--			
MEMO BOND																													
A-25,935	62.8	16.7	4.0	.63	20.2	34.4	36.8	24	22	19.3	14.0	132.5	133.8	80.2	--	--	--	--	74.7	74.6	300+	9.1	60	7.5	60	7.5			
D-25,950	72.0	19.1	4.7	.61	11.5	40.4	38.0	3	3	14.1	8.5	4.1	4.5	92.2	--	--	--	--	70.1	69.6	300+	7.5	80	4.3	200	3.4			
D-25,949	72.3	19.2	4.3	.66	15.0	28.0	27.4	2	2	19.5	11.8	11.0	16.3	91.4	--	--	--	--	70.4	69.4	300+	8.8	80	4.3	200	3.4			
H-25,953	68.6	18.3	6.3	.43	8.1	28.2	33.2	2	1	12.3	6.0	15.5	14.9	97.8	--	--	--	--	39.0	39.6	300+	14.7	100	14.7	200	3.4			
BOND																													
L-25,954	53.9	14.3	3.4	.63	11.0	38.8	38.8	12	5	12.8	6.3	18.7	21.8	94.4	--	--	--	--	53.6	53.3	150	7.5	80	9.9	80	9.9			
L-25,955	57.2	15.2	3.4	.66	8.9	39.2	42.0	5	2	9.8	5.0	5.0	11.2	11.3	87.4	--	--	--	--	76.0	76.5	300+	7.4	80	9.9	80	9.9		
A-25,936	52.9	14.1	3.2	.64	14.6	30.6	30.4	10	16	11.6	10.1	131.6	115.2	74.2	--	--	--	--	75.5	75.2	300+	8.8	80	9.9	80	9.9			
A-25,938	54.5	14.5	2.9	.73	16.1	25.4	27.8	26	16	16.2	12.7	157.3	154.4	73.7	--	--	--	--	75.6	76.3	300+	14.7	100	14.7	100	14.7			
G-25,951	56.0	14.9	3.6	.61	8.5	53.4	46.8	7	3	10.7	6.0	11.7	12.7	89.0	--	--	--	--	85.4	85.2	300+	14.2	155	14.2	155	14.2			
G-25,951	56.1	14.9	2.8	.78	16.0	30.0	36.6	36	12	17.5	7.8	7.8	17.5	300+	87.9	--	--	--	74.9	73.2	300+	10.6	155	10.6	155	10.6			
C-25,945	58.0	15.4	3.3	.69	13.0	46.4	45.2	12	8	12.3	6.9	36.5	36.5	24.9	87.3	--	--	--	--	69.6	69.4	300+	3.6	80	3.6	80	3.6		
O-25,956	58.0	15.4	3.3	.69	13.0	46.4	45.2	12	8	12.3	6.9	36.5	36.5	300+	82.0	--	--	--	--	84.2	83.7	300+	15.5	100	15.5	100	15.5		
A-25,937	74.3	19.8	3.8	.77	27.7	36.6	43.8	36	16	24.8	15.5	300+	300+	92.0	--	--	--	--	82.9	82.4	300+	15.6	155	15.6	155	15.6			
C-25,942	72.0	19.2	3.9	.73	18.2	41.6	49.6	40	11	18.4	9.0	300+	300+	90.7	--	--	--	--	71.9	72.7	300+	14.2	75	14.2	75	14.2			
C-25,944	71.3	19.0	3.7	.76	20.8	48.4	59.0	88	15	24.6	9.0	300+	300+	90.7	--	--	--	--	71.4	72.0	300+	10.6	100	10.6	100	10.6			
D-25,946	72.0	19.2	4.0	.70	12.0	25.4	28.8	2	2	15.1	8.1	12.1	8.9	92.6	--	--	--	--	73.7	73.7	300+	11.7	145	11.7	145	11.7			
D-25,947	72.9	19.4	4.0	.72	14.7	30.2	29.6	1	1	16.1	12.0	14.9	16.2	89.5	--	--	--	--	73.7	73.7	300+	15.2	80	15.2	80	15.2			
G-25,952	69.5	18.5	4.1	.67	14.9	58.2	62.4	15	8	17.3	9.4	28.4	31.4	93.6	--	--	--	--	83.5	82.9	300+	15.2	42	15.2	42	15.2			
C-25,943	63.3	16.8	3.3	.76	17.8	43.8	45.2	25	18	17.3	9.8	85.1	85.8	89.9	--	--	--	--	71.7	72.3	300+	12.9	3.3	12.9	3.3	12.9			
D-25,948	60.3	16.0	3.6	.67	10.2	22.2	23.2	1	1	12.9	7.7	8.5	86.9	--	--	--	--	81.5	81.6	300+	15.9	3.3	15.9	3.3	15.9				
AIRMAIL BOND																													
C-25,939	34.3	9.1	2.0	.68	8.5	15.2	19.3	20	5	10.5	4.7	111.5	101.0	74.0	--	--	--	--	81.1	81.0	300+	15.8	3.3	15.8	3.3	15.8			
C-25,940	30.2	8.0	1.8	.65	9.0	14.2	14.6	16	7	9.2	4.6	63.3	70.8	69.7	--	--	--	--	83.6	83.3	300+	12.9	3.3	12.9	3.3	12.9			
C-25,941	36.0	9.6	1.9	.73	11.4	19.7	22.0	28	10	10.2	5.4	108.1	124.7	73.1	--	--	--	--	83.6	83.3	300+	12.9	3.3	12.9	3.3	12.9			

^{1/}Tests made according to TAPPI Standard Methods except as noted.^{2/}Trade size for the bond papers is 500 sheets, 17 by 22 inches, and for the other papers it is 500 sheets, 24 by 36 inches.

3/MD = Machine direction and CD = Cross direction.



Table 3.-Properties of towel, tissue, napkin, and cigarette papers manufactured in the Philippines

Sheet Properties ^{1/}											
Identifi- cation	Weight		24 by 36 meter - 500		Density	Bursting strength		Tensile		Brightness (Elrepho)	
	G	Lb	Mil	G/cm ³		Pt _S	Pt _W	P _{iw}	P _{iw}	P _{ct}	P _{ct}
					MD ^{2/}						
TOWEL											
Q-25,996	45.9	28.2	6.3	0.29	15.1	1.18	1.01	0.16	0.15	42.6	300+
G-25,990	50.2	30.8	5.1	.39	15.9	2.08	.87	.36	.21	69.0	130
G-25,987	16.1	9.9	2.9	.22	5.3	.19	.04	.02	--	81.6	81.4
TISSUE											
K-25,993	15.1	9.3	2.4	.24	14.0	.37	.06	.01	--	--	90
K-25,991	15.8	9.7	2.7	.23	9.2	.27	.07	.01	--	84.2	84.1
G-25,988	15.4	9.5	2.8	.22	9.1	.38	.05	.08	--	--	50
Q-25,995	29.3	18.0	3.3	.35	12.7	.59	.39	.03	--	72.6	72.4
G-25,986	16.3	10.0	2.6	.25	6.8	.26	.08	.01	--	--	140
NAPKIN											
K-25,992	22.4	13.8	3.9	.23	13.7	.63	.13	.05	--	84.9	84.8
G-25,989	23.9	14.7	3.5	.27	9.5	.47	.16	.05	--	80.0	79.8
CIGARETTE											
K-25,994	21.9	13.4	1.4	.63	51.9	2.20	1.12	.13	.06	95.1	95.3
									--	--	--

^{1/}Tests were made according to TAPPI Standard Methods except as noted.

^{2/}MD = Machine direction; CD = Cross direction

Table 4.-Properties of corrugating medium and linerboard manufactured in the Philippines

Sheet properties^{1/}

Identifi- cation	Weight sq. ft.	Thickness sq. ft.	Density	Bursting strength	Tearing resistance MD ^{2/} CD ^{3/}	Folding endurance MD CD	Porosity (1/4-in. orifice)	Ring crush MD CD	Concora			Modulus of elasticity MD CD	Strain-to- failure Pycnometer thickness MD CD			Concora liner test						
									Maximum strength				Modulus of elasticity MD CD			Strain-to- failure Pycnometer thickness MD CD						
									MD	CD	LB		MD	CD	MD	CD						
CORRUGATING MEDIUM																						
Q-25,926	125.0	25.6	7.4	0.66	30.2	97.2	109.2	41	22	300+	45.2	36.5	41.0	4,440	2,980	689	402	1,49	2.92	6.5	---	---
Q-25,927	126.8	26.0	10.3	.49	33.1	115.2	115.6	112	41	200	49.2	35.0	56.6	4,520	2,190	684	242	1.62	4.09	7.9	---	---
J-25,928	127.0	26.0	7.9	.64	20.6	117.6	126.4	35	9	135	32.3	27.1	24.6	3,620	2,040	660	309	1.08	1.69	6.5	---	---
J-25,929	128.3	26.3	8.9	.57	37.5	113.2	118.8	159	86	180	60.3	43.5	60.5	5,560	2,770	851	354	1.48	2.37	7.3	---	---
J-25,930	159.1	32.6	11.5	.54	49.2	114.4	136.4	146	50	300+	86.4	63.9	81.4	5,660	2,740	1,014	336	1.64	3.36	9.5	---	---
LINERBOARD																						
Q-25,923	186.3	38.2	10.5	.70	72.0	162.4	185.6	249	56	--	86.8	69.7	--	5,770	2,590	941	343	1.54	2.41	10.3	66.6	37.1
Q-25,924	189.8	38.9	11.5	.65	69.2	229.6	262.4	371	187	--	97.4	73.1	--	7,510	3,380	1,379	365	1.26	4.55	10.0	73.2	35.6
Q-25,922	202.1	41.4	10.5	.76	94.0	212.8	255.8	1,339	266	--	110.3	79.5	--	8,980	3,540	1,544	331	1.75	4.63	9.9	83.3	36.8
Q-25,925	342.3	70.2	19.5	.69	139.5	436.8	520.0	2,939	1,826	--	146.8	115.2	--	7,520	3,000	1,091	362	1.67	3.62	18.1	144.8	86.1

^{1/}Tests were made according to TAPPI Standard Methods except as noted. The water absorbency (0.1 cm³) on all sheets was in excess of 300 seconds.^{2/}Tests made with a universal tester equipped with an electrical load cell.^{3/}MD = Machine direction and CD = Cross direction.



Table 5.-Properties of miscellaneous types of papers manufactured in or imported into the Philippines

1/Those with a single letter preceding numbers were manufactured in the Philippines.

2/Tests made according to TAPPI Standard Methods except as noted.
3/Trade size for onion skin is 500 sheets 17 by 22 inches and for

2 i wide size for onion skin 1 by 22 inches, and for the other papers it is 500 sheets, 25 by 38 inches.



Table 6.--Properties of miscellaneous types of paper manufactured in or imported into the Philippines

Identification ²	Sheet properties ¹												Porosity		Turpentine opacity penetration		Cobb size		
	Weight		Thickness		Density		Bursting strength		Tearing resistance		Folding endurance		Wire	Felt	Wire	Felt	Wire	Felt	
	Square meter	24 by 36 meter	500	500	MD	CD	MD	CD	MD	CD	Wire	Felt	Wire	Felt	Wire	Felt	Wire	Felt	
Q-25,982	34.8	21.4	2.8	0.48	6.7	27.4	34.2	---	8.6	3.8	5.2	6.2	85.0	---	9.8	10.2			
P-25,981	59.2	36.3	4.7	.50	15.9	54.6	74.4	---	20.2	9.4	14.0	14.1	97.8	---	15.3	15.5			
0-25,980	69.6	42.7	4.3	.64	31.0	96.8	100.0	---	29.4	13.3	46.1	45.0	92.5	---	24.6	24.7			
KRAFT PAPER																			
N-25,979	66.6	40.9	5.1	.51	30.4	105.6	102.8	---	24.7	14.7	22.4	20.1	93.6	---	20.4	21.2			
SACK GRADE																			
MANILA PAPER																			
A-25,977	60.8	37.4	3.6	.66	16.0	45.0	52.6	---	15.6	9.9	133.2	128.1	92.8	---	25.0	23.4			
C-25,976	60.4	37.1	3.2	.73	16.3	35.6	39.8	---	16.5	7.9	157.4	156.3	90.5	---	19.6	19.6			
E-25,978	106.9	65.7	7.0	.60	46.2	141.6	197.6	---	26.3	16.3	28.6	32.2	100.0	---	29.3	24.5			
GREASEPROOF AND GLASSINE																			
USA-25,975	33.8	20.8	1.6	.82	14.0	10.5	11.0	109	15.0	7.6	1,084	1,062	---	30	90	--	--		
C-25,973	41.6	25.5	2.1	.77	13.2	18.7	22.2	109	24	12.4	1,765	1,213	---	15	15	--	--		
USA-25,974	39.3	24.1	1.4	1.14	19.6	14.9	17.5	708	514	20.8	10.0	4,767	5,688	---	60	60	--	--	

¹/Tests made according to TAPPI Standard Methods except as noted.

²/Those with a single letter preceding numbers were manufactured in the Philippines.

MD = Machine direction and CD = Cross direction.



Table 7.--Properties of boards manufactured in or imported into the Philippines

Sheet properties^{1/}

Identifica- tion	Sheet properties ^{1/}										Tensile strength ^{2/}								
	Weight		Thickness sq. ft.	Density	Bursting strength lb./ sq. in.	Tearing resistance MD/ CD ^{4/}		Stiffness (Taber)		Brightness (Erepho)		Maximum strength MD		Modulus of elasticity MD		Strain-to- failure MD		Pycnometer thickness CD	
	Square meter	Lb				Pts	G	CD	Wire	Felt	CD	1,000 lb/in. ²	1,000 lb/in. ²	Pct	1,000 lb/in. ²	Pct	1,000 lb/in. ²	Pct	Mils
J-26,003	341.8	209.9	16.9	0.80	95.7	247.2	364.8	159.0	63.0	--	--	5,890	2,250	1,157	270	2.09	3.92	15.8	
M-26,004	342.8	210.5	17.9	.75	76.8	276.8	496.8	216.0	60.0	--	--	5,290	1,540	881	194	1.46	4.01	16.6	
O-26,005	456.7	280.4	22.9	.79	121.6	344.0	392.0	360.0	164.0	--	--	5,230	2,480	873	277	1.98	4.87	22.0	
INDEX BOARD																			
D-26,001	137.9	84.7	9.1	.60	18.0	71.2	76.4	17.4	8.4	68.5	68.0	3,000	1,620	556	252	1.02	2.17	7.9	
D-25,998	140.4	86.2	8.3	.67	19.6	68.8	74.8	17.0	8.6	--	--	3,620	2,170	684	342	.91	1.84	7.4	
FILE FOLDER																			
D-25,999	190.1	116.8	9.9	.76	38.2	95.2	101.2	29.8	18.6	40.4	40.6	4,490	2,760	714	362	1.39	2.42	9.1	
D-26,000	214.5	131.7	13.4	.63	32.0	152.0	168.4	54.2	26.4	40.3	39.6	3,050	1,700	644	261	1.11	2.10	12.2	
WHITE BRISTOL																			
USA-26,007	137.3	84.3	7.0	.78	37.2	82.8	90.4	10.6	6.6	--	--	5,020	3,290	634	390	2.22	4.22	6.4	
FOLDCONE																			
USA-26,006	222.5	136.6	12.1	.72	64.0	217.6	222.4	69.6	35.6	--	--	5,420	2,700	1,070	396	1.59	3.63	11.3	
CLAY COATED BOARD																			
Japan-26,008	237.9	146.1	12.5	.75	56.6	104.8	214.4	92.0	34.0	--	--	6,080	1,640	1,174	240	1.51	3.62	11.7	
CHIPBOARD																			
J-26,002	480.9	295.3	29.7	.64	62.2	290.4	382.4	409.0	200.0	--	--	2,060	1,320	676	256	.73	2.03	26.6	

^{1/}Tests made according to TAPPI Standard Methods except as noted.

^{2/}Tests made with a universal tester equipped with an electrical load cell.

^{3/}Those with a single letter preceding number were manufactured in the Philippines.

^{4/}MD = Machine direction and CD = Cross direction.



Table 8.--Properties of hardboards and particleboards manufactured in the Philippines

Type of panel product	Thickness	Density	Static bending ^{1/}			Internal Tensile strength ^{1/}			Dimensional movement ^{2/}			
			Maximum load	Modulus of elasticity	Modulus of maximum stress ^{1/}	Maximum load	Maximum stress	Length	Thickness	From 50 to 90 pct relative humidity to water soak		
Hardboard - standard	3/16	63.9	83	6,990	635	285	1,490	4,980	0.14	7.01	0.33	22.04
Hardboard - standard tempered - smooth	3/16	64.8	95	8,550	678	445	2,050	7,070	.11	5.49	.21	16.93
Hardboard - stucco - embossed	3/16	3/64.0	37	---	---	---	760	---	.18	4.35	.48	19.65
Hardboard - diamond - embossed	3/16	3/64.0	52	---	---	---	1,000	---	.13	5.17	.38	16.45
Particleboard	3/8	50.0	87	2,560	411	26	440	750	.21	4.03	--	--
Particleboard	1/2	51.5	131	3,100	493	85	980	1,300	.21	3.11	--	--

^{1/}Strength properties determined according to ASTM Standard D 1037-72a.

^{2/}Dimensional movement determined on 1/2 by 6-in. specimens preconditioned 30 days at 50 pct relative humidity followed by 30-day exposure to 90 pct relative humidity and 80° F.

^{3/}Nominal density.



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